

Thesis/
Reports
WALSH

FINAL
**Potable Water System
Microscopic Particulate
Analysis**

**Indian Creek
Administrative Site**

**Salmon-Challis
National Forest**

Walsh Project Number: 6137-010

6/14/05

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Environmental Scientists and Engineers, LLC



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FINAL
Potable Water System
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Analysis

Indian Creek Administrative Site
Salmon-Challis
National Forest

6/14/05

Prepared For: USDA Forest Service Region 4

Prepared By:

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WALSH Project Number: 6137-010



Environmental Scientists and Engineers, LLC

MICROSCOPIC PARTICULATE ANALYSIS OF A DRINKING WATER SYSTEM

Water System Name: Indian Creek Administrative Site
District: Yankee Fork Forest: Salmon-Challis
Drinking Water System I.D. Number: 0001.000021
Date of MPA: 6/14/05

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Environmental Scientists and Engineers, LLC

A. Site Identification

1. District:	Yankee Fork
2. Water System Name:	Indian Creek Administrative Site
3. Forest:	Salmon-Challis
4. Water System I.D. Number:	0001.000021
5. Date of MPA:	6/14/05
6. MPA Performed By:	Zane Ross
	Anne Walsh
7. Date of this Report:	6/14/05
8. Report Reviewed By:	Allison Haines

Reviewed By:		
	District Ranger	Date

Reviewed By:		
	Recreation Staff	Date

Reviewed By:		
	Forest Engineer	Date

B. System Description

The Indian Creek Administrative Site is a seasonal office and a work area with three bunkhouses, and is a recreational stop for travelers on the Middle Fork of the Salmon River. It is located approximately 20 miles downriver (northeast) from the Boundry Creek Boat Launch and is accessible only by watercraft or small airplane. It is open from May through September and sees 11,000 visitors per season. It is served by a transient, non-community (TNC) water system consisting of a flowing spring of unknown capacity and approximately 16 points of use.

The spring collection area is located approximately 1,500 feet west and upgradient from the south residence. There is no fence surrounding the collection area and grazing wildlife was noted at the time of sampling. The spring box has a shoebox type steel lid and appears to be in good condition; however, there is no lock on the lid. The spring is equipped with a screened vent with a return bend, and an overflow drainpipe outlet approximately 20 feet east and down gradient from the spring box. The overflow drain is properly daylighted and has adequate rip-rap; however, the screen is not of appropriate mesh size. There are three shutoff valves located in the area; one located between the spring collection area and the spring box, one located below the spring box, and one located below the overflow. The cover on the middle valve is broken and should be replaced.

There is no treatment system currently installed in this system. Due to the fact that there is no power at the site, a chlorination system should be installed that does not require electricity.

The gravity-fed distribution system consists of approximately 3,500 feet of piping of unknown material and size. In addition to the overflow drain from the spring box, there were 4 drains identified in the system located at each of the three residences, and the public hydrant. They were each daylighted and had adequate rip-rap; however, the screens were not of appropriate mesh size. There were 4 additional shutoff valves located in the system, each with a clean valve box and cover.

The 19 points of use in the system were identified as follows:

- ☐ 6 hydrants located within the work area fence
- ☐ One publicly accessible hydrant located outside the fence
- ☐ 4 points of use in each of the three bunkhouses: one toilet, one bathroom sink, one shower, and one kitchen sink.

The publicly accessible hydrant is regularly used by recreational visitors and has a small filtration unit attached. The 7 outdoor hydrants are all threaded and do not have anti-siphon devices attached. The hydrant that serves the horse trough is a potential source of contamination and should have an anti-siphon device installed.

The only other potential source of contamination at the site is wild animal grazing over the spring collection area. The Middle Fork River is over 300 feet east and down gradient from any distribution lines.

There were no use records, system construction information, or a site sampling plan available for review at the site. There were no bacteriological, chemical, physical, nitrate/nitrite, or



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previous microscopic particulate analysis (MPA) test results provided for review.

C. Groundwater Under the Direct Influence of Surface Water (GWUDI) Evaluation

An Environmental Protection Agency (EPA) Region VIII approved assessment of Groundwater Under the Direct Influence of Surface Water (GWUDI) was performed at Ansel Watrous Campground. The assessment was performed to determine the probability of GWUDI. All systems receiving 40 points or more are determined to be probable GWUDI systems, and operators must eliminate the risk factors relating to surface water influence, perform a microscopic particulate analysis (MPA) to determine the extent of surface water influence, or comply with the EPA Surface Water Treatment Rule (SWTR) (54 FR 28486, June 29, 1989). If MPA results indicate the existence of a GWUDI system, the system operators must fully comply with the EPA SWTR. The SWTR includes treatment technique requirements for filtered and unfiltered systems that are intended to protect against the adverse health effects of exposure to *Giardia lamblia*, viruses, and *Legionella*, as well as many other pathogenic organisms. Those requirements include (1) requirements for maintenance of a disinfectant residual in the distribution system; (2) removal and/or inactivation of 3 log (99.9%) for *Giardia* and 4 log (99.99%) for viruses; (3) combined filter effluent turbidity performance standard of 5 NTU as a maximum and 0.5 NTU at the 95th percentile monthly, based on 4-hour monitoring for treatment plants using conventional treatment or direct filtration (with separate standards for other filtration technologies); and (4) watershed protection and other requirements for unfiltered systems.

The water source at Indian Creek Administrative Site received the following GWUDI score as totaled below (and as shown in Section F-2):

Spring...10

Distance between a surface water source and casing or nearest collector lateral is over feet...0

Total GWUDI Score = 10

D. Potential Sources of Contamination

The following potential sources of contamination were identified at the site:

<i>Potential Source of Contamination</i>	<i>Distance (ft)</i>	<i>Direction</i>	<i>Gradient</i>
Animal Grazing	10 feet	West	Upgradient

E. Microscopic Particulate Analysis (MPA) Sampling Event

1. MPA Procedure

The following procedure was followed at Indian Creek Administrative Site for MPA sample collection.

This procedure satisfies sampling requirements for the Consensus Method for Determining Groundwater Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA); EPA 910/9-92-029.

- Samplers flushed the spring box for 4 hours.
- Samplers lowered a submersible pump operated by a hand-held generator into the spring box.
- Samplers purged water from the spring box at a rate no greater than one gallon per minute. Note: samplers recorded pH, conductivity, turbidity, and temperature prior to sampling and upon sampling completion (See Section F-3-C).
- Water was diverted to the ground away from both the storage tank and the hydrant after it was passed through the sampling device in a way that minimized surface erosion. Note: surface erosion prevention measures included drainage troughs, plastic sheeting and engineering controls.
- Following sample collection completion, samplers secured the lid of the spring box.
- The sample filter was placed in a plastic zip-loc bag and wrapped in insulation and an ice pack. This procedure satisfies sampling requirements for the Consensus Method for Determining Groundwater Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA); EPA 910/9-92-029.

- Samplers used the site source pump to fill a 360-gallon tank equipped with a sanitary plastic liner.
- Samplers lowered a submersible pump operated by a hand-held generator into the plastic liner.
- Samplers purged water from the tank during the sampling event (refilling the tank when needed) at a rate no greater than one gallon per minute. Note: samplers recorded pH, conductivity, turbidity, and temperature prior to sampling and upon sampling completion (See Section F-3-C).
- Water was diverted to the ground away from the well after it was passed through the sampling device in a way that minimized surface erosion. Note: surface erosion prevention measures included drainage troughs, plastic sheeting and engineering controls.
- Following sample collection completion, samplers confirmed that the site source pump remained in good condition.
- The sample filter was placed in a plastic zip-loc bag and wrapped in insulation and an ice pack.

2. MPA Laboratory

The sample was delivered to CH Diagnostic and Consulting Services, Inc. in Loveland, Colorado within 24 hours of collection. CH Diagnostic analyzed the sample filter using the method outlined in EPA manual, Consensus Method for Determining Groundwater Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA); EPA 910/9-92-029. Although CH Diagnostics does not participate in any state or federal certification program because there are currently none available, it does participate in the method review

process performed as part of method updates for the industry. In addition, CH Diagnostic was actively involved in the method development process that led to the current approved protocol for microscopic particulates, giardia and cryptosporidium analysis.

The laboratory analytical procedures are compliant with industry approved methodologies. The laboratory uses standardized sample slide reading protocols, random Quality Assurance (QA) officer checks on sample results and/or slide readings, and multiple analytical technicians confirm unknowns. Additionally, an experienced WALSH chemist has reviewed all MPA sample results.

3. MPA Discussion and Results

A microscopic particulate analysis is used to classify a groundwater source as GWUDI based on the detection of certain surface water organisms in the groundwater supply. The presence of these organisms is an indication that the supply is influenced by surface water. Another indication of surface water influence on a groundwater source is if the groundwater turbidities or temperatures rise and fall with changes in the surface water conditions. The extent to which a groundwater source is influenced by surface water is dependent upon the depth of the well, the type of underlying aquifer, the distance between the groundwater source and a surface water source, the well construction, and the drainage control around the wellhead area.

The water source at Indian Creek Administrative Site was sampled for microscopic particulates at the request of the USDA Forest Service Region 2. The sample filter was analyzed for waterborne particulates and a relative risk was determined based on the following scale:

- >20 = high risk of direct surface water influence
- 10-19 = moderate risk of direct surface water influence
- <9 = low risk of direct surface water influence

If the initial score of an MPA is low, regulating agencies may still require a second MPA test. Additionally, if the score is medium to low, regulating agencies may require annual MPA testing, dye tests, and comparisons of turbidity, pH, conductivity, and temperature between the groundwater source and the nearby surface water. Regulating agencies may also require water treatment (i.e. disinfection) of a groundwater source even if the MPA score is low to medium. However, if the MPA score is high, regulating agencies will require filtration and treatment/disinfection of the groundwater source within 18 months.

The MPA results for the water source at Indian Creek Administrative Site are summarized in Table E-1. Detailed laboratory results, including specific particulate detects are attached in Section F-3-B.

TASK NO: 21.00

DESCRIPTION: Methane Collection/Mitigation - Roads

Bid Quantity: 9,950 ft

ASSUMPTIONS: 60-ft wide road at base; 80-ft wide road at top; 10-ft deep excavation; 1:1 side slopes;

compacted fill; two 16-oz geotextile layers w/ 12-in gravel layer at base and sides of

excavation; 3-inch diameter collection pipes along top sides of roads (2); 1 vent every 100

ft each side. Assume 2,500 ft²/hr Production

Task Duration: 380 Hours

	Unit	No. Req'd	Unit Cost	Total Cost		Unit	No. Req'd	Unit Cost	Total Cost
EQUIPMENT					LABOR				
Backhoe, Caterpillar 426	Each	2.00	\$25.85	\$18,614	Foreman	Man	0.00	\$39.40	\$0
Compactor, Vib Smooth Drum CS663	Each	0.00	\$47.58	\$0	Operator Local	Man	0.00	\$22.00	\$0
Dozer, Caterpillar D4	Each	0.00	\$26.37	\$0	Operator Key	Man	4.00	\$33.90	\$48,816
Dozer, Caterpillar D6	Each	0.00	\$87.29	\$0	Laborer Local	Man	4.00	\$17.60	\$25,344
Dozer, Caterpillar D6 LGP w/Winch	Each	1.00	\$88.35	\$31,806	Laborer Key	Man	0.00	\$29.50	\$0
Dozer, Caterpillar D7	Each	0.00	\$89.54	\$0	Site Supervisor	Man	0.00	\$61.45	\$0
Dozer, Caterpillar D8	Each	0.00	\$116.34	\$0	Health and Safety Officer	Man	0.00	\$47.10	\$0
Excavator, Caterpillar 325	Each	1.00	\$69.32	\$24,954	Field Engineer	Man	0.00	\$42.70	\$0
Excavator, Caterpillar 330B	Each	0.00	\$70.18	\$0	Office Engineer	Man	0.00	\$39.40	\$0
Excavator, Caterpillar 330B/wThumb	Each	0.00	\$104.97	\$0	Technician	Man	0.00	\$33.90	\$0
Grader, Caterpillar 140	Each	0.00	\$55.63	\$0	Total Task Labor Cost:				\$74,160
Grader, Caterpillar 14H	Each	0.00	\$78.13	\$0	MATERIALS				
Loader, Caterpillar 966	Each	2.00	\$71.10	\$51,193	Gravel/Road Base	tn	49750	\$9.96	\$495,530
Loader, Caterpillar 988	Each	0.00	\$144.23	\$0	Silt Fence	ft	0	\$1.35	\$0
Scraper, Caterpillar 627 21 Yd	Each	0.00	\$163.77	\$0	Stakes	ea	0	\$1.62	\$0
Scraper, Caterpillar 631 31 Yd	Each	0.00	\$158.81	\$0	Hay Bales	ea	0	\$3.50	\$0
Truck Off-Road, Caterpillar D350	Each	0.00	\$99.13	\$0	Clean Soil Fill	tn	0	\$1.35	\$0
Truck Off-Road, Caterpillar D400	Each	0.00	\$116.15	\$0	Construction Fencing	ft	0	\$1.40	\$0
Water Tower, 12,000 Gallon	Each	0.00	\$14.28	\$0	Drain Rock	tn	0	\$14.54	\$0
Water Wagon, Caterpillar 631	Each	0.00	\$121.32	\$0	3-Inch Dia HDPE Pipe	ft	19900	\$4.31	\$85,713
Water Truck, 5000-Gal	Each	0.00	\$56.89	\$0	Condensate Sump	ea	0	\$915.28	\$0
Crane - 250 Ton w/Weight	ea	0.00	\$480.57	\$0	Gas Well Head	ea	0	\$3,499.60	\$0
Trencher Attachment	ea	0.00	\$12.87	\$0	Manhole	ea	0	\$1,346.00	\$0
Trencher, Skidsteer	ea	0.00	\$18.63	\$0	HDPE Liner (Installed)	sf	0	\$0.54	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0	Geotextile (16 oz)	sf	1791000	\$0.19	\$347,139
Other (Specify) -	ea	0.00	\$0.00	\$0	Vent - Methane	ea	200	\$269.20	\$53,840
Other (Specify) -	ea	0.00	\$0.00	\$0	0	ea	0	\$0.00	\$0
Total Task Equipment Cost:				\$126,568	Total Task Materials Cost:				\$982,222
SUBCONTRACTS					TASK SUMMARY				
	ea	0.00	\$0	\$0	Total Task Labor Cost:				\$74,160.00
	ea	0.00	\$0	\$0	Total Task Equipment Cost:				\$126,567.61
	ea	0.00	\$0	\$0	Total Task Materials Cost:				\$982,221.96
	ea	0.00	\$0	\$0	Total Task Subcontract Cost:				\$0.00
Total Task Subcontract Cost:				\$0	Total Task Cost:				\$1,182,949.58
					Unit Cost:				\$118.89 ft

TASK NO: 22.00

DESCRIPTION: Methane Collection/Mitigation - Pads

Bid Quantity: 452,000 sf

ASSUMPTIONS: Similar to roads (10-ft deep, 1:1 side slopes; 2-layers geotextile w/ 12-in gravel layer); Use Prelim Site Plan Bldg Areas at Pad locations not where trash fully excavated (Pads 1-5 = 118,288 ft²; Hotel A&B & Paint Store = 54,800ft²; Pads 7-9 = 31,000ft²; Pads 10,11, 13 &15 = 27,300 ft²) Total Area = 301,388 ft² Plan View; Increase qty 50% for sides and slopes = 1.5 x 301388 = 452,082 ft²

Task Duration: 180 Hours

	Unit	No. Req'd	Unit Cost	Total Cost		Unit	No. Req'd	Unit Cost	Total Cost
EQUIPMENT					LABOR				
Backhoe, Caterpillar 426	Each	2.00	\$25.85	\$9,307	Foreman	Man	0.00	\$39.40	\$0
Compactor, Vib Smooth Drum CS663	Each	0.00	\$47.58	\$0	Operator Local	Man	0.00	\$22.00	\$0
Dozer, Caterpillar D4	Each	0.00	\$26.37	\$0	Operator Key	Man	4.00	\$33.90	\$24,408
Dozer, Caterpillar D6	Each	1.00	\$87.29	\$15,712	Laborer Local	Man	4.00	\$17.60	\$12,672
Dozer, Caterpillar D6 LGP w/Winch	Each	0.00	\$88.35	\$0	Laborer Key	Man	0.00	\$29.50	\$0
Dozer, Caterpillar D7	Each	0.00	\$89.54	\$0	Site Supervisor	Man	0.00	\$61.45	\$0
Dozer, Caterpillar D8	Each	0.00	\$116.34	\$0	Health and Safety Officer	Man	0.00	\$47.10	\$0
Excavator, Caterpillar 325	Each	1.00	\$69.32	\$12,477	Field Engineer	Man	0.00	\$42.70	\$0
Excavator, Caterpillar 330B	Each	0.00	\$70.18	\$0	Office Engineer	Man	0.00	\$39.40	\$0
Excavator, Caterpillar 330B/wThumb	Each	0.00	\$104.97	\$0	Technician	Man	0.00	\$33.90	\$0
Grader, Caterpillar 140	Each	0.00	\$55.63	\$0	Total Task Labor Cost:				\$37,080
Grader, Caterpillar 14H	Each	0.00	\$78.13	\$0	MATERIALS				
Loader, Caterpillar 966	Each	2.00	\$71.10	\$25,597	Gravel/Road Base	tn	25111	\$9.96	\$250,117
Loader, Caterpillar 988	Each	0.00	\$144.23	\$0	Silt Fence	ft	0	\$1.35	\$0
Scraper, Caterpillar 627 21 Yd	Each	0.00	\$163.77	\$0	Stakes	ea	0	\$1.62	\$0
Scraper, Caterpillar 631 31 Yd	Each	0.00	\$158.81	\$0	Hay Bales	ea	0	\$3.50	\$0
Truck Off-Road, Caterpillar D350	Each	0.00	\$99.13	\$0	Clean Soil Fill	tn	0	\$1.35	\$0
Truck Off-Road, Caterpillar D400	Each	0.00	\$116.15	\$0	Construction Fencing	ft	0	\$1.40	\$0
Water Tower, 12,000 Gallon	Each	0.00	\$14.28	\$0	Drain Rock	tn	0	\$14.54	\$0
Water Wagon, Caterpillar 631	Each	0.00	\$121.32	\$0	3-Inch Dia HDPE Pipe	ft	3000	\$4.31	\$12,922
Water Truck, 5000-Gal	Each	0.00	\$56.89	\$0	Condensate Sump	ea	0	\$915.28	\$0
Crane - 250 Ton w/Weight	ea	0.00	\$480.57	\$0	Gas Well Head	ea	0	\$3,499.60	\$0
Trencher Attachment	ea	0.00	\$12.87	\$0	Manhole	ea	0	\$1,346.00	\$0
Trencher, Skidsteer	ea	0.00	\$18.63	\$0	HDPE Liner (Installed)	sf	0	\$0.54	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0	Geotextile (16 oz)	sf	949200	\$0.19	\$183,978
Other (Specify) -	ea	0.00	\$0.00	\$0	Vent - Methane	ea	30	\$269.20	\$8,076
Other (Specify) -	ea	0.00	\$0.00	\$0	0	ea	0	\$0.00	\$0
Total Task Equipment Cost:				\$63,092	Total Task Materials Cost:				\$455,092
SUBCONTRACTS					TASK SUMMARY				
	ea	0.00	\$0	\$0	Total Task Labor Cost:				\$37,080.00
	ea	0.00	\$0	\$0	Total Task Equipment Cost:				\$63,092.30
	ea	0.00	\$0	\$0	Total Task Materials Cost:				\$455,092.05
	ea	0.00	\$0	\$0	Total Task Subcontract Cost:				\$0.00
Total Task Subcontract Cost:				\$0	Total Task Cost:				\$555,264.35
					Unit Cost:				\$1.23 sf

TASK NO: 23.00 DESCRIPTION: Methane Barrier - West of Majors & Gas Station Bid Quantity: 4,500 ft

ASSUMPTIONS: Assume 25 ft avg depth x 4200 lineal feet; 2 layers geotextile + 1 layer geomembrane ; 3-in dia collection header in 3-ft x 3-ft gravel filled trench along entire length; vent every 100 ft

Task Duration: 168 Hours

	Unit	No. Req'd	Unit Cost	Total Cost
EQUIPMENT				
Backhoe, Caterpillar 426	Each	2.00	\$25.85	\$8,687
Compactor, Vib Smooth Drum CS663	Each	0.00	\$47.58	\$0
Dozer, Caterpillar D4	Each	0.00	\$26.37	\$0
Dozer, Caterpillar D6	Each	0.00	\$87.29	\$0
Dozer, Caterpillar D6 LGP w/Winch	Each	0.00	\$88.35	\$0
Dozer, Caterpillar D7	Each	0.00	\$89.54	\$0
Dozer, Caterpillar D8	Each	0.00	\$116.34	\$0
Excavator, Caterpillar 325	Each	1.00	\$69.32	\$11,645
Excavator, Caterpillar 330B	Each	0.00	\$70.18	\$0
Excavator, Caterpillar 330B/wThumb	Each	0.00	\$104.97	\$0
Grader, Caterpillar 140	Each	0.00	\$55.63	\$0
Grader, Caterpillar 14H	Each	0.00	\$78.13	\$0
Loader, Caterpillar 966	Each	2.00	\$71.10	\$23,890
Loader, Caterpillar 988	Each	0.00	\$144.23	\$0
Scraper, Caterpillar 627 21 Yd	Each	0.00	\$163.77	\$0
Scraper, Caterpillar 631 31 Yd	Each	0.00	\$158.81	\$0
Truck Off-Road, Caterpillar D350	Each	0.00	\$99.13	\$0
Truck Off-Road, Caterpillar D400	Each	0.00	\$116.15	\$0
Water Tower, 12,000 Gallon	Each	0.00	\$14.28	\$0
Water Wagon, Caterpillar 631	Each	0.00	\$121.32	\$0
Water Truck, 5000-Gal	Each	0.00	\$56.89	\$0
Crane - 250 Ton w/Weight	ea	0.00	\$480.57	\$0
Trencher Attachment	ea	0.00	\$12.87	\$0
Trencher, Skidsteer	ea	0.00	\$18.63	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0
Total Task Equipment Cost:				\$44,222

SUBCONTRACTS

	ea	0.00	\$0	\$0
	ea	0.00	\$0	\$0
	ea	0.00	\$0	\$0
	ea	0.00	\$0	\$0
Total Task Subcontract Cost:				\$0

	Unit	No. Req'd	Unit Cost	Total Cost
LABOR				
Foreman	Man	0.00	\$39.40	\$0
Operator Local	Man	0.00	\$22.00	\$0
Operator Key	Man	3.00	\$33.90	\$17,086
Laborer Local	Man	4.00	\$17.60	\$11,827
Laborer Key	Man	0.00	\$29.50	\$0
Site Supervisor	Man	0.00	\$61.45	\$0
Health and Safety Officer	Man	0.00	\$47.10	\$0
Field Engineer	Man	0.00	\$42.70	\$0
Office Engineer	Man	0.00	\$39.40	\$0
Technician	Man	0.00	\$33.90	\$0
Total Task Labor Cost:				\$28,913

MATERIALS

Gravel/Road Base	tn	2250	\$9.96	\$22,411
Silt Fence	ft	0	\$1.35	\$0
Stakes	ea	0	\$1.62	\$0
Hay Bales	ea	0	\$3.50	\$0
Clean Soil Fill	tn	0	\$1.35	\$0
Construction Fencing	ft	0	\$1.40	\$0
Drain Rock	tn	0	\$14.54	\$0
3-Inch Dia HDPE Pipe	ft	4500	\$4.31	\$19,382
Condensate Sump	ea	0	\$915.28	\$0
Gas Well Head	ea	0	\$3,499.60	\$0
Manhole	ea	0	\$1,346.00	\$0
HDPE Liner (Installed)	sf	112500	\$0.54	\$60,570
Geotextile (16 oz)	sf	225000	\$0.19	\$43,610
Vent - Methane	ea	45	\$269.20	\$12,114
0	ea	0	\$0.00	\$0
Total Task Materials Cost:				\$158,088

TASK SUMMARY

Total Task Labor Cost:	\$28,912.80
Total Task Equipment Cost:	\$44,221.90
Total Task Materials Cost:	\$158,087.70
Total Task Subcontract Cost:	\$0.00
Total Task Cost:	\$231,222.40
Unit Cost:	\$51.38 ft

TASK NO: 24.00

DESCRIPTION: Methane Collection - Parking Lots

Bid Quantity: 60 ac

ASSUMPTIONS:

Assume collection pipe 200 ft ctrs (~200 ft pipe/trench/acre); 12,000 lf collection pipe and 3-ft x 3-ft trench; 2 layers geotextile w/ 1-ft gravel collection layer; Production 1/4 acre/hr

Task Duration: 240 Hours

	Unit	No. Req'd	Unit Cost	Total Cost		Unit	No. Req'd	Unit Cost	Total Cost
EQUIPMENT					LABOR				
Backhoe, Caterpillar 426	Each	1.00	\$25.85	\$6,205	Foreman	Man	0.00	\$39.40	\$0
Compactor, Vib Smooth Drum CS663	Each	0.00	\$47.58	\$0	Operator Local	Man	0.00	\$22.00	\$0
Dozer, Caterpillar D4	Each	0.00	\$26.37	\$0	Operator Key	Man	4.00	\$33.90	\$32,544
Dozer, Caterpillar D6	Each	2.00	\$87.29	\$41,898	Laborer Local	Man	4.00	\$17.60	\$16,896
Dozer, Caterpillar D6 LGP w/Winch	Each	0.00	\$88.35	\$0	Laborer Key	Man	0.00	\$29.50	\$0
Dozer, Caterpillar D7	Each	0.00	\$89.54	\$0	Site Supervisor	Man	0.00	\$61.45	\$0
Dozer, Caterpillar D8	Each	0.00	\$116.34	\$0	Health and Safety Officer	Man	0.00	\$47.10	\$0
Excavator, Caterpillar 325	Each	0.00	\$69.32	\$0	Field Engineer	Man	0.00	\$42.70	\$0
Excavator, Caterpillar 330B	Each	0.00	\$70.18	\$0	Office Engineer	Man	0.00	\$39.40	\$0
Excavator, Caterpillar 330B/wThumb	Each	0.00	\$104.97	\$0	Technician	Man	0.00	\$33.90	\$0
Grader, Caterpillar 140	Each	0.00	\$55.63	\$0	Total Task Labor Cost:				\$49,440
Grader, Caterpillar 14H	Each	0.00	\$78.13	\$0	MATERIALS				
Loader, Caterpillar 966	Each	2.00	\$71.10	\$34,129	Gravel/Road Base	tn	151200	\$9.96	\$1,506,012
Loader, Caterpillar 988	Each	0.00	\$144.23	\$0	Silt Fence	ft	0	\$1.35	\$0
Scraper, Caterpillar 627 21 Yd	Each	0.00	\$163.77	\$0	Stakes	ea	0	\$1.62	\$0
Scraper, Caterpillar 631 31 Yd	Each	0.00	\$158.81	\$0	Hay Bales	ea	0	\$3.50	\$0
Truck Off-Road, Caterpillar D350	Each	0.00	\$99.13	\$0	Clean Soil Fill	tn	0	\$1.35	\$0
Truck Off-Road, Caterpillar D400	Each	0.00	\$116.15	\$0	Construction Fencing	ft	0	\$1.40	\$0
Water Tower, 12,000 Gallon	Each	0.00	\$14.28	\$0	Drain Rock	tn	0	\$14.54	\$0
Water Wagon, Caterpillar 631	Each	0.00	\$121.32	\$0	3-Inch Dia HDPE Pipe	ft	12000	\$4.31	\$51,686
Water Truck, 5000-Gal	Each	0.00	\$56.89	\$0	Condensate Sump	ea	0	\$915.28	\$0
Crane - 250 Ton w/Weight	ea	0.00	\$480.57	\$0	Gas Well Head	ea	0	\$3,499.60	\$0
Trencher Attachment	ea	0.00	\$12.87	\$0	Manhole	ea	0	\$1,346.00	\$0
Trencher, Skidsteer	ea	0.00	\$18.63	\$0	HDPE Liner (Installed)	sf	0	\$0.54	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0	Geotextile (16 oz)	sf	5227200	\$0.19	\$1,013,157
Other (Specify) -	ea	0.00	\$0.00	\$0	Vent - Methane	ea	120	\$269.20	\$32,304
Other (Specify) -	ea	0.00	\$0.00	\$0	0	ea	0	\$0.00	\$0
Total Task Equipment Cost:				\$82,231	Total Task Materials Cost:				\$2,603,160
SUBCONTRACTS					TASK SUMMARY				
	ea	0.00	\$0.00	\$0	Total Task Labor Cost:				\$49,440.00
	ea	0.00	\$0.00	\$0	Total Task Equipment Cost:				\$82,231.30
	ea	0.00	\$0.00	\$0	Total Task Materials Cost:				\$2,603,159.69
	ea	0.00	\$0.00	\$0	Total Task Subcontract Cost:				\$0.00
Total Task Subcontract Cost:				\$0	Total Task Cost:				\$2,734,830.99
					Unit Cost:				\$45,580.52 ac

TASK NO: 25.00

DESCRIPTION: Methane Mitigation - Water Quality Ponds

Bid Quantity: 6.98 ac

ASSUMPTIONS:

Assume same system configuration as parking lots; One header pipe along entire length of WQ ponds ~3,000 ft; Assume 75-ft long cross pipe every 100-ft = 2,250 ft 2 layers geotextile

Task Duration: 28 Hours

	Unit	No. Req'd	Unit Cost	Total Cost		Unit	No. Req'd	Unit Cost	Total Cost
EQUIPMENT					LABOR				
Backhoe, Caterpillar 426	Each	0.00	\$25.85	\$0	Foreman	Man	0.00	\$39.40	\$0
Compactor, Vib Smooth Drum CS663	Each	0.00	\$47.58	\$0	Operator Local	Man	0.00	\$22.00	\$0
Dozer, Caterpillar D4	Each	0.00	\$26.37	\$0	Operator Key	Man	3.00	\$33.90	\$2,848
Dozer, Caterpillar D6	Each	2.00	\$87.29	\$4,888	Laborer Local	Man	4.00	\$17.60	\$1,971
Dozer, Caterpillar D6 LGP w/Winch	Each	0.00	\$88.35	\$0	Laborer Key	Man	0.00	\$29.50	\$0
Dozer, Caterpillar D7	Each	0.00	\$89.54	\$0	Site Supervisor	Man	0.00	\$61.45	\$0
Dozer, Caterpillar D8	Each	0.00	\$116.34	\$0	Health and Safety Officer	Man	0.00	\$47.10	\$0
Excavator, Caterpillar 325	Each	0.00	\$69.32	\$0	Field Engineer	Man	0.00	\$42.70	\$0
Excavator, Caterpillar 330B	Each	0.00	\$70.18	\$0	Office Engineer	Man	0.00	\$39.40	\$0
Excavator, Caterpillar 330B/wThumb	Each	0.00	\$104.97	\$0	Technician	Man	0.00	\$33.90	\$0
Grader, Caterpillar 140	Each	0.00	\$55.63	\$0	Total Task Labor Cost:				\$4,819
Grader, Caterpillar 14H	Each	0.00	\$78.13	\$0	MATERIALS				
Loader, Caterpillar 966	Each	1.00	\$71.10	\$1,991	Gravel/Road Base	tn	2625	\$9.96	\$26,146
Loader, Caterpillar 988	Each	0.00	\$144.23	\$0	Silt Fence	ft	0	\$1.35	\$0
Scraper, Caterpillar 627 21 Yd	Each	0.00	\$163.77	\$0	Stakes	ea	0	\$1.62	\$0
Scraper, Caterpillar 631 31 Yd	Each	0.00	\$158.81	\$0	Hay Bales	ea	0	\$3.50	\$0
Truck Off-Road, Caterpillar D350	Each	0.00	\$99.13	\$0	Clean Soil Fill	tn	0	\$1.35	\$0
Truck Off-Road, Caterpillar D400	Each	0.00	\$116.15	\$0	Construction Fencing	ft	0	\$1.40	\$0
Water Tower, 12,000 Gallon	Each	0.00	\$14.28	\$0	Drain Rock	tn	0	\$14.54	\$0
Water Wagon, Caterpillar 631	Each	0.00	\$121.32	\$0	3-Inch Dia HDPE Pipe	ft	5250	\$4.31	\$22,613
Water Truck, 5000-Gal	Each	0.00	\$56.89	\$0	Condensate Sump	ea	0	\$915.28	\$0
Crane - 250 Ton w/Weight	Each	0.00	\$480.57	\$0	Gas Well Head	ea	0	\$3,499.60	\$0
Trencher Attachment	ea	0.00	\$12.87	\$0	Manhole	ea	0	\$1,346.00	\$0
Trencher, Skidsteer	ea	0.00	\$18.63	\$0	HDPE Liner (Installed)	sf	0	\$0.54	\$0
Other (Specify) -	ea	0.00	\$0.00	\$0	Geotextile (16 oz)	sf	608098	\$0.19	\$117,864
Other (Specify) -	ea	0.00	\$0.00	\$0	Vent - Methane	ea	53	\$269.20	\$14,133
Other (Specify) -	ea	0.00	\$0.00	\$0	0	ea	0	\$0.00	\$0
Total Task Equipment Cost:				\$6,879	Total Task Materials Cost:				\$180,756
SUBCONTRACTS					TASK SUMMARY				
	ea	0.00	\$0.00	\$0	Total Task Labor Cost:				\$4,818.80
	ea	0.00	\$0.00	\$0	Total Task Equipment Cost:				\$6,878.92
	ea	0.00	\$0.00	\$0	Total Task Materials Cost:				\$180,755.76
	ea	0.00	\$0.00	\$0	Total Task Subcontract Cost:				\$0.00
Total Task Subcontract Cost:				\$0	Total Task Cost:				\$192,453.48
					Unit Cost:				\$27,572.13 ac

Table E-1: MPA Results Summary

Sample ID	Sample Date/Time	Volume Purged (gallons)	Sample Information	MPA Score
0001.000021	6/14/2005 12:50:00 PM to 6/15/2005 7:57:00 AM	1157.4	pH = 7.67 to 7.73 Temp. = 18.0°C to 11.3°C Turb. = 0 NTU to 0 NTU Cond. = pCi/L to pCi/L	1

°C = degrees Celsius

ft. = feet

pCi/L = picocuries per liter

Cond. = conductivity

ID = identification

MPA = microscopic particulate analysis

NTU = nephelometric turbidity unit

Temp. = temperature

Turb. = turbidity

The MPA score for the water source was determined based on relative risk factors associated with the presence of primary bio-indicators (particulates). Table E-2 summarizes the numerical range of each particulate associated with surface water influence counted per 100 gallons of water, and indicates the significance of the number counted (i.e. extremely heavy, heavy, moderate, rare, or not significant). Table E-3 lists the relative risk factors associated with the number of each particulate counted.

**Table E-2: Numerical Range of Each Primary Bio-Indicator
Counted Per 100 Gallons Water**

Indicators of Surface Water	EH	H	M	R	NS
Giardia	>30	16-30	6-15	1-5	<1
Coccidia	>30	16-30	6-15	1-5	<1
Diatoms	>150	41-149	11-40	1-10	<1
Other Algae	>300	96-299	21-95	1-20	<1
Insects/Larvae	>100	31-99	16-30	1-15	<1
Rotifers	>150	61-149	21-60	1-20	<1
Plant Debris	>200	71-200	26-70	1-25	<1

EH = extremely heavy

H = heavy

M = moderate

R = rare

NS = not significant

Table E-3: Primary Bio-Indicators and Associated Risk Factors

Indicators of Surface Water	Relative Risk Factor				
	EH	H	M	R	NS
Giardia	40	30	25	20	0
Coccidia	35	30	25	20	0
Diatoms	16	13	11	6	0
Other Algae	14	12	9	4	0
Insects/Larvae	9	7	5	3	0
Rotifers	4	3	2	1	0
Plant Debris	3	2	1	0	-

EH = extremely heavy

H = heavy

M = moderate

R = rare

NS = not significant

The MPA results for this water sources are scored as follows:

Particulate detects (see Section F-3-B for laboratory MPA results).

Algae = 0/100 gallons

Diatoms = 0/100 gallons

Plant Debris = 0/100 gallons

Rotifers = 10/100 gallons

Nematodes= 87/100 gallons

Pollen (pine) = 116/100 gallons

Ameba = 194/100 gallons

Ciliates = 0/100 gallons

Colorless Flagellates = 0/100 gallons

Crustaceans = 0/100 gallons

Other Arthropods = 10/100 gallons

Other = Highest value was recorded from results of two MPA.

Amorphous Debris = inorganic precipitate, clay (1-2 micrometers), silt (2-50 micrometers), aggregates

From Tables E-2 and E-3, the MPA Score for this site is:

1 - Low Risk per EPA Consensus Method

F. Attachments

1. System Construction Information

2. Groundwater Under the Direct Influence of Surface Water (GWUDI) Evaluation

3. Microscopic Particulate Analysis Sampling Event

A. Apparatus

B. Results

C. Field Notes and Database Forms

4. Maps and/or Site Plan

5. Photographs

1. System Construction Information

**No System Construction Information
was available for this site.**

2. Groundwater Under the Direct Influence of Surface Water (GWUDI) Evaluation



United State Environmental Protection Agency, Region 10
Idaho Operations Office

ASSESSMENT OF GROUND WATER UNDER THE DIRECT INFLUENCE OF SURFACE
WATER AND SUBJECT TO THE SURFACE WATER TREATMENT RULE

A. Type of Subsurface Water Source (Check Only One)

- ☐ Well, equal to or greater than 50 feet deep...0
- ☐ Well, less than 50 feet deep or no well log available...5
- ☒ Spring...10
- ☐ Infiltration Gallery...10

B. Historical Microbiological Contamination (Check all that apply)

- ☐ History or suspected outbreak of Giardia or other pathogenic organisms associated with surface water with current system configuration...50
- ☐ Record of total coliform acute MCL violations over last 3 years...30
- Record of total coliform monthly MCL violations over last 3 years
- ☐ One month...5
- ☐ Two months...10
- ☐ Three months...20
- ☐ Regulatory agency verifies complaints about turbidity or suspected waterborn disease...10

C. Hydrogeological Features (Check all that apply)

- Distance between a surface water source and casing or nearest collector lateral
- ☒ Over 200 feet...0
- ☐ 100-200 feet...5
- ☐ Less than 100 feet...10
- ☐ Intake is located on floodplain at approximate altitude of stream...20
- ☐ Surface runoff drains toward intake...15
- ☐ Exposed aquifer that is coarse alluvial, cavernous, or fractured is used for water supply...15

D. Water Intake Structure (Check all that apply)

- ☐ Poorly constructed well, or spring collection chamber (uncase, or casing not cemented to depth of at least 20 feet below land surface)...15
- ☐ Poor sanitary seal, or seal without acceptable material...15
- ☐ Intake open to atmosphere...15
- ☐ Leaks of source collector that allow entry of surface water...15

Remarks:

An MPA is required for all sites scoring 40 points or more.

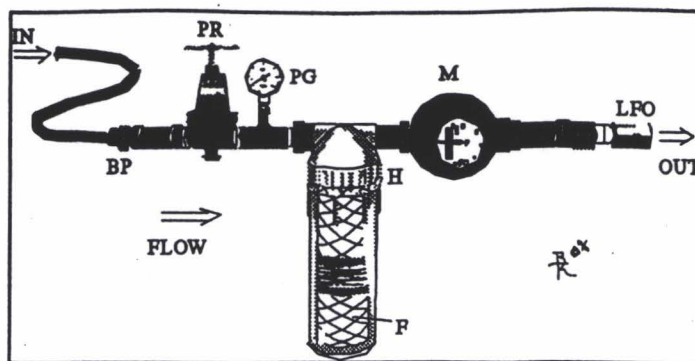
Total GWUDI Score = 10

3. Microscopic Particulate Analysis Sampling Event

A. Apparatus

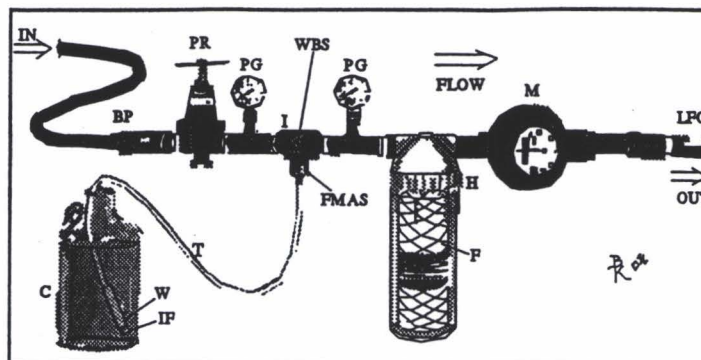
EQUIPMENT

1. Inlet hose (washing machine hose)
2. Backflow preventor (BP) (not included because air gap at effluent)
3. Pressure regulator (PR)
4. Pressure gauge (PG)
5. Filter housing (H) Fulflo LT10
6. 1 micron nominal porosity filter (F) Parker Hannifan M39R10A
7. Meter (M)
8. Limiting flow orifice (LFO) 3.785 L/min. (1 gal/min)



Additional Equipment for chlorinated samples:

9. Large sanitary container (C) for sodium thiosulfate solution
10. Injector (I) with:
 - a. water bypass screw (WBS)
 - b. Fine metering adjustment screw (FMAS)
 - c. tubing (T)
 - d. injector filter (IF)
 - e. porcelain weight (W)
11. Second pressure gauge



Equipment on loan from CH Diagnostic is clean and ready to use. Otherwise, clean equipment thoroughly before use.

OTHER SUPPLIES

- (1) Turbidimeter (optional); (2) pH meter (optional); (3) Thermometer (optional); (4) Sanitary latex gloves; (5) Heavy duty zip-loc 1 gallon freezer bags; (6) Frozen ice packs and cooler for shipping; (7) For chlorinated water: sodium thiosulfate and distilled water or sample water (see page 2); (8) For non-pressurized source: 2-4 Liter/minute gas or electric pump.

Example of a Meter Reading

Meter Reading						
0	0	0	2	5	3	0
1,000,000 gallon mark	100,000 gallon mark	10,000 gallon mark	1,000 gallon mark	100 gallon mark	10 gallon mark	This digit remains zero, read the gallons from the red meter hand.
This meter reads 2,530. If the red meter hand is on the 4, then it reads 2,534.						

B. Results

ANALYSIS FOR WATERBORNE PARTICULATES

CH Diagnostic and Consulting Service, Inc.
214 SE 19th Street, Loveland, CO 80537
Brec L. Clay, President/Treasurer; Gregory D. Sturbaum, President/Secretary
(970) 667-9789

Invoice 20050463

Customer 20031455
Walsh Environmental
4888 Pearl E. Circle, Suite 108
Boulder, CO 80301

Laboratory Information

Postal Express, 6/17/2005; 1025 Hrs. 19.2°C, Wound
Results submitted by:

Brec L. Clay *Gregory D. Sturbaum*

Sample Identification: Indian Creek GS, #1, 0001 000021

Sample Information: SOURCE: Spring, 3000' from surface water; Unchlorinated; pH 7.67 → pH 7.73, 18°C → 11.3°C

Sample Date & Time: 6/14/2005 12:50 PM → 6/15/2005 07:57 AM

Sampler: Z. Ross/A. Walsh

Amount: 4380.759 L (1157.4 gal)

Filter Color: Off white

Filter Type: Polypropylene wound cartridge

Date/Time Eluted: 6/17/2005 12:06 PM

Centrifugate: 0.00183 mL/100 L

RESULTS OF MICROSCOPIC PARTICULATE ANALYSIS

Amount of sample assayed: 53 L

Amorphous Debris	clay (1-2 µm), silt (2-50 µm), inorganic precipitate, aggregates
Algae	ND
Diatoms	ND
Plant debris	ND
Rotifers	ND
Nematodes	58/100 Gal
Pollen (pine)	86/100 Gal
Ameba	122/100 Gal, test
Ciliates	ND
Colorless Flagellates	ND
Crustaceans	ND
Other Arthropods	ND
Other	ND

Giardia and Coccidia are none detected (ND) by MPA unless reported under "Other".

This sample was analyzed for particulates following the Environmental Protection Agency Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA). 1992 USEPA, Port Orchard, WA, EPA/910/9-92-029. All limitations stated in the methods apply. If HV capsule or foam filter was received, method was modified by filtering sample through a Pali Envirochek™ HV capsule or IDEXX Filta-Max™ filter at the sample site. If Giardia and Cryptosporidium Analysis was also performed, particulate extraction was modified.

COMMENTS: Score: 0-Low Risk per EPA Consensus Method referenced above.

ANALYSIS FOR WATERBORNE PARTICULATES

CH Diagnostic and Consulting Service, Inc.
214 SE 19th Street, Loveland, CO 80537
Brec L. Clay, President/Treasurer; Gregory D. Sturbaum, President/Secretary
(970) 667-9789

Invoice 20050463

Customer 20031455
Walsh Environmental
4888 Pearl E. Circle, Suite 108
Boulder, CO 80301

Laboratory Information

Postal Express; 6/17/2005; 1025 Hrs; 19.4°C; Wound
Results submitted by:

Brec L. Clay *Gregory D. Sturbaum*

Sample Identification: Indian Creek GS, #2, 0001 000022

Sample Information: SOURCE: Spring; 3000' from surface water; Unchlorinated, pH 7.71 —» pH 7.75, 14.6°C —» 10.8°C

Sample Date & Time: 6/14/2005 12:50 PM —» 6/15/2005 07:57 AM

Sampler: Z. Ross/A. Walsh

Amount: 3907.256 L (1032.3 gal)

Filter Color: Off white

Filter Type: Polypropylene wound cartridge

Date/Time Eluted: 6/17/2005 11:56 AM

Centrifugate: 0.00128 mL/100 L

RESULTS OF MICROSCOPIC PARTICULATE ANALYSIS

Amount of sample assayed: 39 L

Amorphous Debris	clay (1-2 µm), silt (2-50 µm), inorganic precipitate, aggregates
Algae	ND
Diatoms	ND
Plant debris	ND
Rotifers	10/100 Gal
Nematodes	87/100 Gal
Pollen (pine)	116/100 Gal
Ameba	194/100 Gal, test
Ciliates	ND
Colorless Flagellates	ND
Crustaceans	ND
Other Arthropods	10/100 Gal
Other	ND

Giardia and Coccidia are none detected (ND) by MPA unless reported under "Other".

This sample was analyzed for particulates following the Environmental Protection Agency Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA). 1992. USEPA, Port Orchard, WA. EPA 910/9-92-029. All limitations stated in the methods apply. If HV capsule or foam filter was received, method was modified by filtering sample through a Pall Envirochek™ HV capsule or IDEXX Filta-Max™ filter at the sample site. If Giardia and Cryptosporidium Analysis was also performed, particulate extraction was modified.

COMMENTS: Score: 1-Low Risk per EPA Consensus Method referenced above.

C. Field Notes and Database Forms



Microscopic Particulate Analysis

Field Data

Region - 04

Forest

Salmon-Challis

Code:

04

Water System Name:

Indian Creek Administrative Site

District:

Yankee Fork

County:

Valley

Date Sampled:

6/14/05

System CN:

0001.000021

Additional ID #1:

Type:

Additional ID #2:

Type:

Real Property Number:

MPA - Field Data

1. General Site Information
2. Contacts/Escorts
3. Short Survey
4. Well Log Information
5. GPS and Photographs
6. Sample Information
7. Field Notes

MPA-Field Data

System CN: 0001.000021

1. General Information

Type of Site:	Recreation/Administration	Classification:	transient, non-community (TNC)
Type of system:	spring	Currently in use:	Yes
Year of installation:	Unknown		
Approximate number of people per day using site:	Unknown		
Site opened annually from	April	to	October
Location:	On the Middle Fork of the Salmon River, approximately 20 miles downriver (northeast) from the Boundry Creek Boat Launch.		
Remarks:	Site accessible only by watercraft or by airplane.		

System CN: 0001.000021

2. Contacts/Escorts

Forest Service Contact:	Rick		
Title:	Unknown		
Was sampling appointment scheduled in advance?	Yes	Method of Scheduling:	Telephone
Additional Individuals Present During MPA:	Chastity and Vincent, Interpreters		
Campers / Recreational Individuals Present During MPA	Yes		
Remarks:	Rafters use the site as a rest stop and campground		

MPA - Field Data

System CN: 0001.000021

3. Short Survey

Spring

Spring Type: ☐ Flowing ☐ Spring Capacity: gpm ☐ Adequate Fence ☒ Adequate Lid

Spring Improvements: There is no lock on the springbox lid and there is no fence surrounding the spring to prevent animal grazing; however, there is no human traffic around the spring collection area. The screened vent is not the proper mesh size.

Well

☐ Casing is 12" above natural grade ☐ Concrete slab is present

Improvements:

Pump

☐ Handpump ☐ Submersible Pump ☐ Supply Pump
☐ Adequate Pump Protection ☐ Adequate Pump Protection

Improvements:

Treatment

Disinfection Type: ☐ Not Applicable ☐ Sedimentation ☒ Filtration

Improvements: A filter is installed on the hydrant which is accessible to the public. There is no additional treatment for this system.

Storage

☐ Hydropneumatic ☒ Below Ground ☐ Above Ground
Number: 0 Number: 1 Number: 0
Capacity: 0 Gallons Capacity: 0 Gallons Capacity: 0 Gallons

Improvements:

MPA - Field Data

System CN: 0001.000021

3. Short Survey Continued

Distribution Line

Material: Unknown

Approximate Length: 0 Feet

Number of Connections: 0

Number of Drains: 0

Improvements:

Power Supply

Power Supply Type:

Improvements:

Potential Sources of Contamination

There is no fence to prevent animal grazing and traffic over the spring collection area. The Middle Fork River is located over 300 downgradient from a distribution line.

Remarks:

MPA - Field Data

System CN: 0001.000021

4. Well Log Information

☒ Spring

Well

Well Permit Number:

Driller Name:

Well Log:

Phone:

Year Drilled:

License #:

Section:

Township:

Range:

Type:

Casing

Diameter:

Material:

Wall Thickness:

Inches

Depth

Ground surface to bottom of well:

Feet

Ground surface to bottom of casing:

Feet

Ground surface to first draw:

Feet

Screen Interval From: 0 to: 0 Feet Below Ground Surface

Static water level: feet below ground surface

Capacity: (gpm) at feet drawdown:

Type of sanitary seal:

Well Screen

Well Screen Material:

Sanitary Cover Type:

Vented:

Pitless Adapter:

Remarks:

MPA- Field Data

System CN: 0001.000021

5. GPS and Photographs

GPS

Latitude: 44 Degrees 46 Minutes ☒ N ☐ S Elevation: 3988 Feet

Longitude: 115 Degrees 7 Minutes ☐ E ☒ W Accuracy: 77 Feet

Object / Location Being Mapped: Spring Box

Type of GPS Equipment: Hand-held Garmin Etrex Venture

Equipment Problems: Cloud cover prevented a more accurate GPS reading

Comments:

Photographs

☐ Photographs Were Taken

Description of Photographs:

Remarks:

MPA-Field Data

System CN: 0001.000021

6. Sample Information

Primary Sample

Volume Sampled: 1157.4

Sample Identification Number: 0001.000021

Start Date: 6/14/2005

Start Time: 12:50:00 PM

Stop Date: 6/15/2005

Stop Time: 7:57:00 AM

Analyses

☒ Analyze by Method Number EPA 910/9-92-029☐ Add Giardia and Cryptosporidium☐ Sampled water was chlorinated

Initial Parameters

ph: 7.67

Temperature: 18.0 C

Turbidity: 0 NTU

Conductivity: pCi/L

Final Parameters

pH: 7.73

Temperature: 11.3 C

Turbidity: 0 NTU

Conductivity: pCi/L

Field Duplicate Sample

☒ Field Duplicate Taken at this site

Volume Sampled: 1032

Field Duplicate Identification Number: 0001.000022

Start Date: 6/14/2005

Start Time: 12:50:00 PM

Stop Date: 6/15/2005

Stop Time: 7:57:00 AM

Analyses

☒ Analyze by Method Number EPA 910/9-92-029☐ Add Giardia and Cryptosporidium☐ Sampled water was chlorinated

Initial Parameters

pH: 7.71

Temperature: 14.6 C

Turbidity: 0 NTU

Conductivity: pCi/L

Final Parameters

pH: 7.75

Temperature: 10.8 C

Turbidity: 0 NTU

Conductivity: pCi/L

All Samples

Report Results To: Allison Haines

Method of Sample Delivery: USPS Express Service

☐ Rush Analyses (Quick Turn-around)

Special Instructions:

Remarks:

Two samples were taken at the same time for this campground. Sample #1 is the 'primary' and #2 is the 'duplicate' but each is considered a separate MPA.

Laboratories

System CN: 0001.000021

Laboratory:

CH Diagnostics

Laboratory Address:

CH Diagnostics 214 19th Street Loveland, Colorado 80537

Remarks:

None

MPA - Field Data

System CN: 0001.000021

7. Field Notes

Field Notes: Sample was taken from hydrant located south of the Office near the landing strip. Filtration unit was removed from hydrant to collect unfiltered water.

4. Map and/or Site Plan

SYMBOLS FOR FIELD SKETCHES

SOURCES

 SUB	Indicates a well source with a submersible pump
 HP	Indicates a well source with a handpump
 SPR	Indicates a spring source
 SUR	Indicates a surface source
 MUN	Indicates a municipal source

PUMPS

X SUB	Indicates a submersible pump
X SUP	Indicates a supply pump

TREATMENT

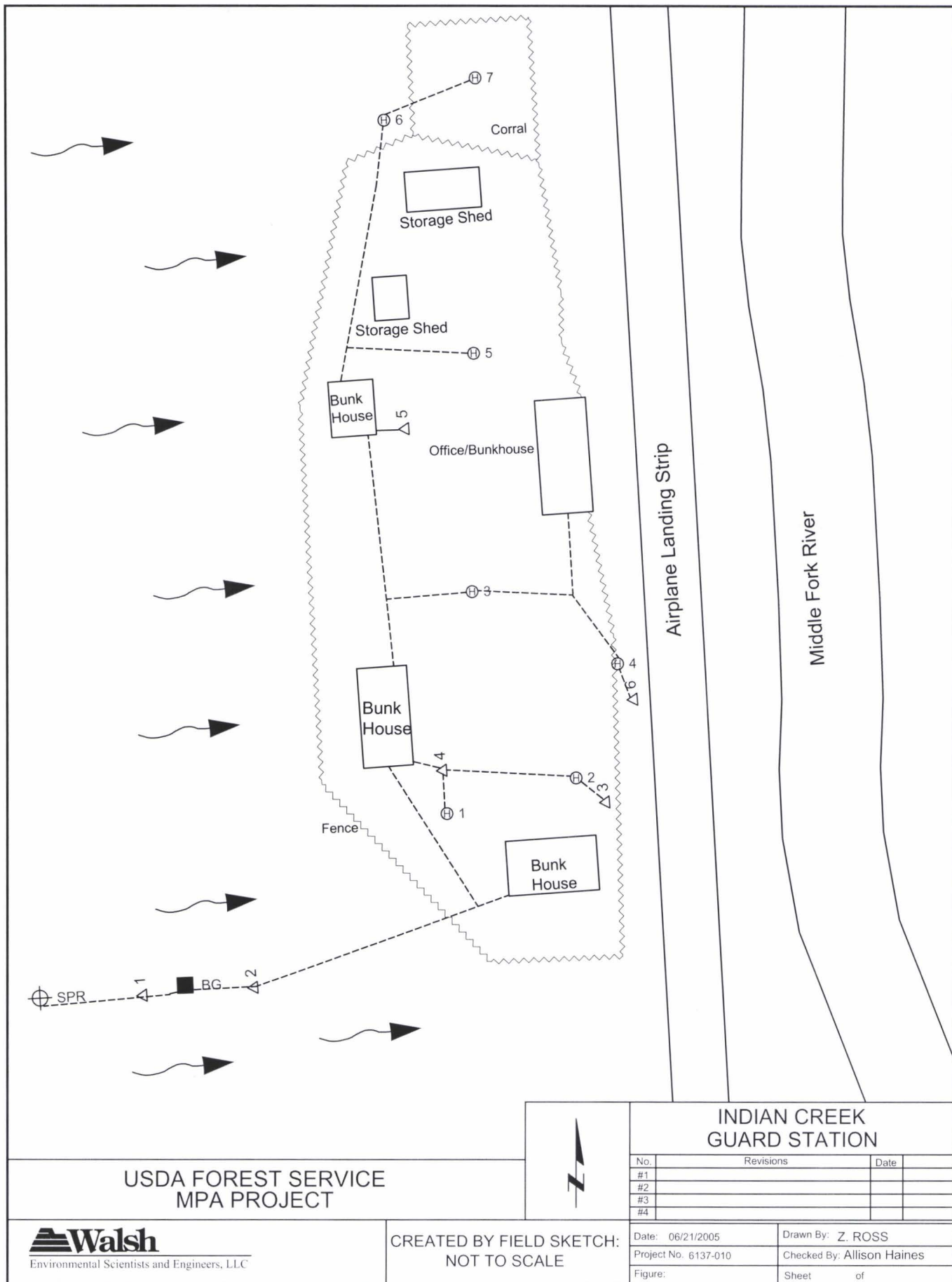
+ CL	Indicates a chlorine treatment system
+ ID	Indicates a iodine treatment system
+ OZ	Indicates an ozone treatment system
+ FIL	Indicates a filtration system

STORAGE

■ HYD	Indicates a hydropneumatic storage tank
■ ELEV	Indicates an elevated storage tank
■ BG	Indicates a below ground storage tank
■ OTHER	Indicates another type of storage tank

DISTRIBUTION AND POINT OF USE

Δ 1	Indicates drain number 1, 2, 3, 4, etc.
⊕ 1	Indicates point of use number 1, 2, 3, 4, etc.
——	Indicates verified distribution line
-----	Indicates estimated distribution line





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